

PATENT APPLICATION  
OF  
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FOR  
BREW CHAMBER FOR A SINGLE  
SERVE BEVERAGE BREWER

## BACKGROUND OF THE INVENTION

### 1. Field of the Invention

This invention relates generally to single serve beverage brewers, and is concerned in particular with the provision of a novel and improved brew chamber for such brewers.

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### 2. Description of the Prior Art

In known brew chambers for single serve beverage brewers, such as those disclosed for example in U.S. Patent Nos. 5,325,765; 6,079,315; 6,142,063; and 6,606,938, a disposable beverage filter cartridge is pierced by inlet and outlet probes to accommodate a through flow of metered hot water. The hot water infuses a dry beverage medium contained in the cartridge to thereby produce a single serving of the beverage.

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The brew chambers are opened and closed by automatically operable mechanisms that have proven to be reliable, although relatively complex and expensive.

Other beverage brewers of the type disclosed for example in WO 02/43541 A1 have brew chambers that are opened and closed manually, but these also employ unduly complicated operating mechanisms.

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Moreover, the prior art brew chambers, be they automatically or manually operated, suffer from an added disadvantage in that their cartridge or pod receptacles remain vertical and thus inconveniently oriented when the chambers are opened.

There exists a need, therefore, for an improved beverage chamber that has a relatively simple and inexpensive operating mechanism, with the capability of presenting the cartridge receptacle in a forwardly inclined position, thus enhancing its accessibility during both insertion of fresh cartridges and retrieval of spent cartridges.

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### SUMMARY OF THE INVENTION

A brew chamber in accordance with the present invention has a receptacle with an open top configured and dimensioned to receive a beverage filter cartridge. A fixed frame supports the receptacle for pivotal movement about a first axis between a vertical brew position and a forwardly inclined open position. A lid is supported on the frame for pivotal movement about a second axis between a raised position allowing access to the forwardly inclined open receptacle, and a lowered position closing the receptacle in its vertical brew position. The first and second axes are parallel. A linkage connects the receptacle to the lid and serves to pivotally manipulate the receptacle between its open and brew positions in response to movement of the lid between its raised and lowered positions.

These and other features and advantages of the present invention will now be described in greater detail with reference to the accompanying drawings, wherein:

### BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 is a front perspective view of a single serve beverage brewer, with a brew chamber in accordance with the present invention shown in its closed condition;

Figure 2 is a side elevational view of the brewer as shown in Figure 1;

Figure 3 is a view similar to Figure 1 showing the brew chamber in its open condition;

Figure 4 is a side elevational view of the brewer as shown in Figure 3;

Figure 5 is a side view of the brew chamber and its operating mechanism removed from the brewer housing, the chamber being shown open;

Figure 6 is a view similar to Figure 5 showing the brew chamber in the process of being closed;

Figure 7 is a view similar to Figures 5 and 6 showing the brew chamber closed; and

Figure 8 is a top plan view of the closed brew chamber.

#### DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS

With reference initially to Figures 1-4, a single serve beverage brewer is shown at 10  
5 having a housing 12 with a forwardly protruding shelf 14 arranged to support a cup 16 for the  
brewed beverage.

The housing 12 contains components conventionally included in brewers of this type,  
including, inter alia, a water tank, heater, pump, electronic controls, etc. These are well known  
to those skilled in the art, and thus have not been illustrated, nor will they be described further in  
10 this specification. Suffice it to say that these components coact in response to the user's  
command to deliver a metered amount of heated water to a brew chamber generally indicated at  
18.

The brew chamber includes a cartridge receptacle 20 and a lid 22. The receptacle has an  
open top configured and dimensioned to receive a beverage filter cartridge 24 (see Figures 3 and  
15 4). The cartridge 24 is preferably of the type disclosed, for example, in U.S. Patent No.  
5,840,189, the description of which is herein incorporated by reference. Cartridge 24 includes an  
impermeable piercable container internally subdivided by a filter element into two  
compartments, one of which contains a dry beverage medium. Alternatively, the brew chamber  
could be employed to process beverage pods that typically are structured with soluble beverage  
20 materials confined between top and bottom filter media.

With reference additionally to Figures 5-8, the brew chamber 18 includes a frame  
structure 26 secured in any known manner within the brewer housing 12.

The receptacle 20 is supported by the frame structure for pivotal movement about a first axis  $A_1$  between a vertical brew position, as shown in Figures 1, 2, 7 and 8, and a forwardly inclined open position, as shown in Figures 3, 4 and 5.

5 The lid 22 is supported by the frame structure 26 for pivotal movement about a second axis  $A_2$  between a lowered closed position, again as shown in Figures 1, 2, 7 and 8, and a raised open position as shown in Figures 3, 4 and 5. The raised lid allows access to the forwardly inclined receptacle for convenient insertion and removal of a beverage filter cartridge 24. The lowered lid closes and cooperates with the receptacle to enclose a filter cartridge during the brew cycle. As shown in Figure 6, the lid carries an inlet probe 28 and as shown in Figure 7, the base  
10 of the receptacle includes an outlet probe 30. The probes pierce the cartridge as the lid is lowered to its closed position, thus accommodating a through flow of heated water into the cartridge via the inlet probe for infusion with the beverage medium contained in the cartridge, with the resulting brewed beverage exiting via the outlet probe for delivery to the underlying cup 16. As mentioned previously, a beverage pod could be employed alternatively, with water  
15 flowing into the brew chamber via an inlet port or ports rather than an inlet probe, with the brewed beverage exiting the brew chamber via an outlet port or ports.

As can be seen in Figures 5-8, a linkage generally indicated at 32 connects the receptacle 20 to the lid 22 and serves to pivot the former between its vertical brew and forwardly inclined positions in response to movement of the latter between its lowered and raised positions. The  
20 linkage includes arms 34 secured at their upper ends to the lid 22, and carrying pins 36 at their lower ends. The pins 36 are positioned to ride in contoured slots 38 in opposite sides of the receptacle 20. The slots 38 have upper horizontal segments 38a communicating at bends 38b with rearwardly inclined and somewhat enlarge lower segments 38c.

A generally U-shaped operating handle 40 has its ends connected to the lid 22 for pivotal movement about a third axis  $A_3$  parallel to the first and second axes  $A_1$ ,  $A_2$ . The handle 40 carries connecting arms 42 pivotally connected as at 44 to links 46 which in turn are pivotally connected as at 48 to the frame structure 26.

5           When the receptacle 20 is in its forwardly inclined open position as shown in Figure 5, the operating handle 40 is at an angle of approximately  $90^\circ$  with respect to the lid 22, and the pins 36 on arms 34 are at the rearmost ends of the horizontal slot segments 38a.

          As the arm 40 is pivoted forwardly about axis  $A_3$  (Figure 6), the pins 36 on arms 34 progress around the slot bends 38b, pivotally urging the receptacle about axis  $A_1$  rearwardly  
10   from its forwardly inclined position. Simultaneously, the cooperative pivotal action of the arms 42 and links 46 causes the lid 22 to be pivotally lowered about axis  $A_2$ .

          At the closed position shown in Figure 7, the pins 36 on arms 34 have reached the lower ends of the slots 38, and the operating arm 40 is substantially parallel to the fully lowered lid 22.

          In light of the foregoing, it will now be understood that the mechanism of the present  
15   invention is relatively simple, involving as major components the receptacle 20, lid 22 and handle 40 respectively mounted for pivotal movement about parallel axes  $A_1$ ,  $A_2$  and  $A_3$ . The brew chamber 18 can accommodate various types of disposable filter packages, including the filter cartridge 24 shown in the drawings, as well as filter pods. When the brew chamber is  
20   opened, the receptacle is inclined forwardly to facilitate insertion of fresh filter packages and removal of spent filter packages.

          We claim: